CLAIMS

1. A method for producing an oxide superconductor comprising: placing a precursor of an oxide superconductor in a state where it is on a substrate material containing pure metal or a compound which is meltable in the precursor when the precursor is in a partially molten state, and producing the oxide superconductor by partial melting and solidifying the precursor in said state.

2. The method for producing an oxide superconductor according to claim 1, wherein the substrate material consists of a pure metal or compound which is meltable in the partially molten precursor uniformly and which does not allow formation of a portion, at which a reaction proceeds spontaneously to form stress concentration cracks resulting from a difference in the coefficients of thermal expansion between the substrate material and the oxide superconductor.

3. The production method of an oxide superconductor according to claim 1, wherein the oxide superconductor is an RE-Ba-Cu-O based oxide superconductor, and the RE represents a rare earth element, and the substrate material is a material that contains Ba or Cu in a molten state but does not contain a rare earth element.

4. The production method of an oxide superconductor according to claim 1, wherein, after placing an intermediate layer containing at least one selected from the group consisting of

Y_2O_3, Yb_2O_3, Er_2O_3, Ho_2O_3, Dy_2O_3, Eu_2O_3, Sm_2O_3, Gd_2O_3, ZrO_2, Al_2O_3, $BaZrO_3$, MgO and yttrium stabilized zirconia on a mount made of a heat-resistant material, the substrate material is placed on the mount, and the precursor of the oxide superconductor is placed on the substrate material for conducting partial melting and solidification of the precursor.

5. The production method of an oxide superconductor according to claim 1, wherein the substrate material contains at least one selected from the group consisting of a pure metal of Ba or Cu, oxides, composite oxides, carbonates, sulfides, sulfates, chlorides, hydroxides and nitrates of Ba or Cu.

6. The production method of an oxide superconductor according to claim 5, wherein the oxide, composite oxide, carbonate, sulfide, sulfate, chloride, hydroxide or nitrate of Ba or Cu is BaO, CuO, Cu_2O, $BaCuO_2$, $BaCO_3$, $CuCO_3$, BaS, CuS, $BaSO_4$, $CuSO_4$, $BaCl_2$, CuCl, $CuCl_2$, $Ba(OH)_2$, $Cu(OH)_2$, $Ba(NO_3)_2$ or $Cu(NO_3)_2$.

7. The production method of an oxide superconductor according to any one of claims 3 to 6, wherein the substrate material comprises at least one selected from noble metals including Ag, Au, Pt and Pd and their oxides.

8. A substrate material for supporting a precursor of an oxide superconductor, wherein the substrate material is used for a process for producing an oxide superconductor by solidification from a partially molten state of a precursor of an RE-Ba-Cu-O

based oxide superconductor, and RE represents a rare earth element, and the substrate material is a material which contains Ba or Cu but does not contain a rare earth element in the partially molten state.

9. The substrate material for supporting a precursor of an oxide superconductor according to claim 8, wherein the substrate material is an aggregate of powder.

10. The substrate material for supporting a precursor of an oxide superconductor according to claim 8, wherein the substrate material contains at least one selected from the group consisting of a pure metal of Ba or Cu, an oxide, composite oxide, carbonate, sulfide, sulfate, chloride, hydroxide and nitrate of Ba or Cu.

11. The substrate material for supporting precursor of an oxide superconductor according to claim 10, wherein the oxide, composite oxide, carbonate, sulfide, sulfate, chloride, hydroxide and nitrate of Ba or Cu is BaO, CuO, Cu_2O, $BaCuO_2$, $BaCO_3$, $CuCO_3$, BaS, CuS, $BaSO_4$, $CuSO_4$, $BaCl_2$, CuCl, $CuCl_2$, $Ba(OH)_2$, $Cu(OH)_2$, $Ba(NO_3)_2$ or $Cu(NO_3)_2$.

12. The substrate material for supporting a precursor of an oxide superconductor according to any one of claims 8 to 11, wherein the substrate material contains at least one selected from the group consisting of noble metals including Ag, Au, Pt and Pd, and their oxides.

13. An RE-Ba-Cu-O based oxide superconductor, wherein RE represents a rare earth element, and the oxide superconductor includes a portion, which is solidified after melting and contains one of or both of Ba and Cu but does not contain a rare earth element, on an outside face of the oxide superconductor, and the solidified portion corresponds to a substrate material which is used for supporting a precursor of the RE-Ba-Cu-O based oxide superconductor when the precursor was melted and solidified.

14. The oxide superconductor according to claim 13, wherein at least one selected from noble metals including Ag, Au, Pt and Pd is additionally contained in the solidified portion.

15. The oxide superconductor according to claim 13, wherein the solidified portion is formed in the bottom of the oxide superconductor.

16. The oxide superconductor according to any of claims 13 to 15, wherein trapped magnetic field distributions on the top side and bottom side of the oxide superconductor are similar.